

WHAT IS CLAIMED IS:

1. A sterically stabilized liposome carrier for combination with a drug for aerosol administration, the sterically stabilized liposome being compatible with a respiratory tract of a mammal and effective to extend the effective life of the drug in the respiratory tract by a time equal to at least twice the effective life of the drug alone.
2. The carrier of claim 1 wherein the time is equal to at least three times the effective life of the drug alone.
3. The carrier of claim 1 wherein the carrier comprises phosphatidylcholine.
4. The carrier of claim 3 wherein the carrier further comprises phosphatidylglycerol.
5. The carrier of claim 1 wherein the drug comprises budesonide.
6. The carrier of claim 1 wherein the drug comprises triamcinolone.
7. The carrier of claim 3 wherein the carrier further comprises poly(ethylene glycol).
8. The carrier of claim 8 wherein the poly(ethylene glycol) has a molecular weight from about 500 to about 5,000 daltons.
9. The carrier of claim 1 wherein at least one of phosphatidylcholine, phosphatidylglycerol, and poly(ethylene glycol) attached to a lipid such as phosphatidylethanolamine, have acyl chains containing from about 16 to about 18 carbon atoms.
10. The carrier of claim 9 wherein the acyl chains contain from about 8 to about 18 carbon atoms.

11. The carrier of claim 9 wherein the acyl groups comprise at least one of distearoyl, stearoyl oleoyl, stearoyl palmitoyl, dipalmitoyl, dioleoyl, palmitoyl oleoyl and dipalmitoleoyl.

12. The carrier of claim 1 wherein the carrier comprises at least one of poly(ethylene glycol)-conjugated lipids, phosphatidylinositol, dipalmitoylphosphatidylpolyglycerol, lipid conjugated polyoxyethylene, lipid conjugated polysorbate, or lipids conjugated other hydrophilic steric coating molecules safe for in vivo use, the sterically stabilized liposome being effective to extend the effective lifetime of a drug in the respiratory tract of a mammal.

13. The carrier of claim 1 wherein the carrier is phosphatidylcholine, phosphatidylglycerol, poly(ethylene glycol)-distearylphosphatidyl diethanolamine, with or without cholesterol.

14. The carrier of claim 1 wherein the drug is a drug useful for treatment of the respiratory tract of the mammal and is compatible with the sterically stabilized liposome.

15. The carrier of claim 14 wherein the drug is selected from the group consisting of budesonide, flunisolide, triamcinolone, beclomethasone, fluticasone, mometasone, dexamethasone, hydrocortisone, methylprednisolone, prednisone, cotisone, betamethasone, terbutaline, albuterol, ipratropium, pirbuterol, epinephrine, salmeterol, levalbuterol, formoterol, montelukast, zafirlukast, zileuton, loratadine, cetirizine, isoniazid, ethambutol, pyrazinamide, rifamycin, rifampin, streptomycin, clarithromycin, azelastine, theophylline, amikacin, gentamicin, tobramycin, rifabutin, rifapentine, sparfloxacin, ciprofloxacin, quinolones, azithromycin, erythromycin, and isoniazid.

16. The carrier of claim 1 wherein the carrier comprises egg-derived or soybean-derived phosphatidylcholine.

17. The carrier of claim 1 wherein the carrier comprises egg-derived or soybean derived phosphatidylglycerol.

18. A composition comprising a sterically stabilized liposome carrier in combination with a drug, the composition being compatible with a respiratory tract of a mammal, aerosol administration and effective to extend the effective life of the drug in the respiratory tract by a time equal to at least twice the effective life of the drug alone.

19. The composition of claim 18 wherein the time is equal to at least three times the effective life of the drug alone.

20. The composition of claim 18 wherein the carrier comprises phosphatidylcholine.

21. The composition of claim 20 wherein the carrier further comprises phosphatidylglycerol.

22. The composition of claim 20 wherein the phosphatidylcholine is present in an amount equal to from about 50 to about 100 weight percent.

23. The composition of claim 21 wherein the carrier comprises from about 0 to about 50 weight percent phosphatidylglycerol.

24. The composition of claim 20 wherein the carrier further comprises poly(ethylene glycol).

25. The composition of claim 25 wherein the poly(ethylene glycol) has a molecular weight from about 500 to about 5,000 Daltons.

26. The composition of claim 18 wherein at least one of phosphatidylcholine, phosphatidylglycerol or poly(ethylene glycol)-derivatized lipid have acyl chains containing from about 10 to about 40 carbon atoms.

27. The composition of claim 26 wherein the acyl groups comprise at least one of distearoyl, stearoyl oleoyl, stearoyl palmitoyl, dipalmitoyl, dioleoyl, palmitoyl oleoyl and dipalmitoleoyl.

29. The composition of claim 18 wherein the carrier comprises at least one of poly(ethylene glycol)-conjugated lipids, phosphatidylinositol, dipalmitoylphosphatidylpolyglycerol, lipid conjugated polyoxyethylene, lipid conjugated polysorbate, or lipids conjugated other hydrophilic steric coating molecules safe for in vivo use, the sterically stabilized liposome being effective to extend the effective lifetime of a drug in the respiratory tract of a mammal.

30. The composition of claim 18 wherein the carrier is phosphatidylcholine, phosphatidylglycerol, poly(ethylene glycol)-distearylphosphatidyl diethanolamine.

31. The composition of claim 18 wherein the drug is a drug useful for treatment of the respiratory tract of the mammal that is compatible with the sterically stabilized liposome.

32. The composition of claim 31 wherein the drug is selected from the group consisting of budesonide, flunisolide, triamcinolone, beclomethasone, fluticasone, mometasone, dexamethasone, hydrocortisone, methylprednisolone, prednisone, cortisone, betamethasone, terbutaline, albuterol, ipratropium, pirbuterol, epinephrine, salmeterol, levalbuterol, formoterol, montelukast, zafirlukast, zileuton, loratadine, cetirizine, isoniazid, ethambutol, pyrazinamide, rifamycin, rifampin, streptomycin, clarithromycin,

azelastine, theophylline, amikacin, gentamicin, tobramycin, rifabutin, rifapentine, sparfloxacin, ciprofloxacin, quinolones, azithromycin, erythromycin, and isoniazid.

33. The composition of claim 18 wherein the carrier comprises egg-derived or soybean-derived phosphatidylcholine.

34. The composition of claim 18 wherein the carrier comprises egg-derived or soybean-derived phosphatidylglycerol.

35. A method for treating a respiratory tract of a mammal by aerosol administration of an effective amount of a composition comprising a sterically stabilized liposome carrier for combination with a drug, and a drug, the sterically stabilized liposome being compatible with a respiratory tract of a mammal and effective to extend the effective life of the drug in the respiratory tract by a time equal to at least twice the effective life of the drug alone.

36. The method of claim 35 wherein the carrier comprises phosphatidylcholine.

37. The method of claim 36 wherein the carrier further comprises phosphatidylglycerol.

38. The method of claim 36 wherein the phosphatidylcholine is present in an amount equal to from about 50 to about 100 weight percent.

39. The carrier of claim 37 wherein the carrier comprises from about 0 to about 50 weight percent phosphatidylglycerol.

40. The method of claim 36 wherein the carrier further comprises poly(ethylene glycol) .

41. The method of claim 40 wherein the poly(ethylene glycol) has a molecular weight from about 500 to about 5,000 daltons.

42. The method of claim 35 wherein at least one of phosphatidylcholine, phosphatidylglycerol, and poly(ethylene glycol) attached to a lipid such as phosphatidylethanolamine, have acyl chains containing from about 16 to about 18 carbon atoms.

43. The method of claim 42 wherein the acyl chains contain from about 8 to about 18 carbon atoms.

44. The method of claim 42 wherein the acyl groups comprise at least one of distearoyl, stearoyl oleoyl, stearoyl palmitoyl, dipalmitoyl, dioleoyl, palmitoyl oleoyl and dipalmitoleoyl.

45. The method of claim 35 wherein the carrier comprises at least one of poly(ethylene glycol)-conjugated lipids, phosphatidylinositol, dipalmitoylphosphatidylpolyglycerol, lipid conjugated polyoxyethylene, lipid conjugated polysorbate, or lipids conjugated other hydrophilic steric coating molecules safe for in vivo use, the sterically stabilized liposome being effective to extend the effective lifetime of a drug in the respiratory tract of a mammal.

46. The method of claim 35 wherein the carrier is phosphatidylcholine, phosphatidylglycerol, poly(ethylene glycol)-distearylphosphatidyl diethanolamine, with or without cholesterol.

47. The method of claim 35 wherein the drug is a drug useful for treatment of the respiratory tract of the mammal and is compatible with the sterically stabilized liposome.

48. The method of claim 47 wherein the drug is selected from the group consisting of budesonide, flunisolide, triamcinolone, beclomethasone, fluticasone, mometasone, dexamethasone, hydrocortisone, methylprednisolone, prednisone, cotisone,

betamethasone, terbutaline, albuterol, ipratropium, pirbuterol, epinephrine, salmeterol, levalbuterol, formoterol, montelukast, zafirlukast, zileuton, loratadine, cetirizine, isoniazid, ethambutol, pyrazinamide, rifamycin; rifampin, streptomycin, clarithromycin, azelastine, theophylline, amikacin, gentamicin, tobramycin, rifabutin, rifapentine, sparfloxacin, ciprofloxacin, quinolones, azithromycin, erythromycin, and isoniazid.

49. The method of claim 35 wherein the carrier comprises egg-derived or soybean derived phosphatidylglycerol.

50. The method of claim 35 wherein the carrier comprises egg-derived or soybean derived phosphatidylglycerol.

51. The method of claim 35 wherein the drug is budesonide.

52. The method of claim 35 wherein the drug is triamcinolone.